

CLAIMS

1. A dose application counter for an injection device with a dose setting element, the counter having a member with a lost motion connection to the dose setting element, whereby movement of said element by and beyond a  
5 predetermined amount causes movement of said member to a set extent, each such movement of said member resulting in the indication of usage of the injection device.
2. A dose application counter according to claim 1 for an injection device of the form having a dose setting knob rotatable with respect to the body of the  
10 device, the counter comprising a rotatable ring with an annular array of projections co-axial with the knob, the minimum dose requiring the knob to be turned from a zero position through an angle at least as great as the angular spacing of adjacent projections, an element rotatable with the knob and spring-urged to engage a projection when the knob is at zero, and a cam fixed to the  
15 body of the device and arranged to disengage said element from the ring when the projection has been pushed round by the element through a predetermined angle and to maintain that disengagement on further rotation, the ring and body having external markings to indicate the circumferential advances of the ring, wherein the application of a dose and the consequent reversion of the knob to its  
20 zero position brings said element back to engage another projection while the ring remains static.
3. A dose counter as claimed in claim 2, wherein the ring is positioned between the knob and the body of the device.
4. A dose counter as claimed in claim 2 or claim 3, wherein the projections

are formed by ratchet teeth internal of the ring, and the element that engages the teeth is a peg that extends in the axial direction beyond the ring for co-operation also with the cam.

5        5.        A dose counter as claimed in claim 4, wherein the peg is at the free end of a generally spiral finger whose other end is rotationally fast with the knob, the finger being of a plastics material and being so shaped and dimensioned that it acts as a spring.

10        6.        A dose counter as claimed in any one of claims 1 to 5, wherein the cam is in the form of another co-axial ring, but with its circular aperture expanded outwards over a sector corresponding to the pitch between adjacent teeth, the radius of most of the aperture being less than that of the circle tangential to the tips of the teeth.

15        7.        A dose application counter according to claim 1, for an injection device of the form having a non-rotatable plunger retractable from the rear end of a syringe housing to set a dose and movable forwards into the housing on ejection of the dose, the counter comprising a unidirectionally rotatable sleeve with multi-start internal screw threading carried by the housing, a projection resiliently carried by the plunger, which passes through the sleeve and which, through its projection and the screw threading, generates rotation of the sleeve as it is retracted, the minimum dose requiring the projection to traverse at least the full axial length of the sleeve and the screw threading being shaped so that the resilient projection jumps threads on forward movement of the plunger, with the sleeve held against counter-rotation, and external markings on the sleeve and housing to indicate the circumferential advances of the sleeve.

20

8. A dose counter as claimed in claim 7, wherein the unidirectional rotation is achieved by having a ratchet engagement between the sleeve and the housing.

5 9. A dose counter as claimed in claim 7 or claim 8, wherein the screw threading comprises coarse pitch square section grooves and the length of the sleeve is such that the rear end of each part-helical groove registers in the axial direction with the forward end of the adjacent groove.

10 10. A dose counter as claimed in claim 9, wherein the sides of the grooves that face circumferentially and slightly rearwardly are chamfered at their rear ends so that, as the plunger moves forward, the projection hits a sloping surface that wedges the projection inwards onto the land area between adjacent grooves, so that the projection will then snap into the adjacent groove.

15 11. A dose application counter for an injection device with a dose setting element, of a form substantially as herein described, with reference to the accompanying drawings.

12. Any novel combination of features of a dose application counter for an injection device with a dose setting element, of a form as described as herein, and/or as shown in the accompanying drawings.